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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/600,206	11/13/2000	Graham O'Neill	31652/04000	7913
24024	7590	11/15/2006	EXAMINER	
CALFEE HALTER & GRISWOLD, LLP 800 SUPERIOR AVENUE SUITE 1400 CLEVELAND, OH 44114			MEI, XU	
			ART UNIT	PAPER NUMBER
			2615	

DATE MAILED: 11/15/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/600,206

Applicant(s)

O'NEILL ET AL.

Examiner

Xu Mei

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 August 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 11,12,30-32 and 34-50 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 11,12,30-32 and 34-41 is/are allowed.
- 6) ☒ Claim(s) 42-50 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

1. This communication is responsive to the applicant's amendment dated 08/28/2006.

Response to Arguments

2. Applicant's arguments, see page 7-8, filed 08/28/2006, with respect to the rejection(s) of claim(s) 30-32 and 34-39 under 35 USC 103(a) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn.
3. Regarding claims 42-50, the arguments filed 08/28/2006 are deemed not persuasive, and the rejection is maintained as stated below.

Applicant mainly argued on page 8-9 of the Remark filed 08/28/2006 that the filter 42 of Orban is not a tone control circuit is noted, however, the Examiner disagreed. The filter 42 (i.e., elements of fig. 2 that including the elements as in claim 42) is used to control the specific frequency bandwidth of the entire system as disclosed by Orban, and would have inherently effect the harmonic distortion of the signals that generated by the system itself. This would have also directly or indirectly affect the acoustic tone of the output signals being generated by the entire system.

In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir.

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1986). The 103 rejection by the combinations of Orban and Ngarmnil would have included all the limitations as claimed as in claims 42-50, and reasonable motivations in view of one of ordinary skilled in the art are also provided as stated above.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 42-48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Orban (US Patent 4,525,857) in view of Ngarmnil et al. (Hereinafter "Ngarmnil") (Ngarmnil, J. et al., "A fully tuneable micropower log-domain filter", IEE Colloquium on Low Power Analogue and Digital VLSI: ASICS, Techniques and Applications, London, 2 Jun 1995 Page(s) 9/1 - 9/4).

Regarding Claim 42, Orban discloses an analogue signal processor (Fig. 2), comprising an audio signal input (40), an output (46) for providing a processed audio output signal, and a tone control circuit coupling the input and the output and comprising first (60) and second (62) filters having different low-pass bands and a subtractor (76) for subtracting the output currents of the filters to produce a filtered signal (46). Orban does not disclose the filters being log-domain MOS transistors operating in weak inversion and being tuneable in the audio frequency range to adjust the low-pass cut-off

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frequency. Ngarmnil discloses a log domain MOS transistor filter operating in weak inversion and the cut-off frequency of the filter can be tuned via a current source (Page 9/1, I and II). Ngarmnil further discloses that the log-domain filter is very attractive to low power filters and very suitable for the applications in biomedical signal processing such as filters for electronic cochlea (Page 9/3, Conclusion). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the cochlear implant of Orban with the low-pass filter as disclosed by Ngarmnil since Ngarmnil discloses it is very suitable for biomedical applications such as electronic cochlea and in order to produce a circuit requiring less power consumption.

Regarding Claim 43, Ngarmnil further discloses a log converter (i.e. compressor) (Figure 1) coupling the input of a tone control circuit for compressing the dynamic range of the input signal.

Regarding Claim 44, it would have been obvious to one of ordinary skill in the art at the time the invention was made that a voltage-to-current converter would be a possible mode of implementation for the compressor as illustrated by Waldhauer (US Patent 4,882,761) (Column 2, lines 51-56).

Regarding Claim 45, Ngarmnil further discloses the MOS transistors operating in weak inversion (Page 9/1, II).

Regarding Claim 46, Ngarmnil further discloses that compressor (Fig. 1) provides control of sensitivity (Page 9/1, I).

Regarding Claim 47, it would have been obvious to one of ordinary skill in the art at the time the invention was made that an amplifier could be placed after the tone control circuit for increasing the output to a desired level.

Regarding Claim 48, Ngarmnil further discloses the input of Figures 1 and 2 being a current source (i.e. current signal).

6. Claim 49 and 50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Orban as modified as applied to claim 42 above, and further in view of Shannon et al. (US Patent 5,549,658).

Regarding Claim 49, as stated above apropos of claim 42, Orban as modified makes obvious all elements of that claim but does not disclose a biphasic signal generator for supplying a biphasic signal. Shannon et al. discloses a biphasic signal generator (Figure 5, generator 72) for supplying to the output a biphasic signal modulated by the processed audio output signal. Shannon et al. teaches biphasic signals permit signals to be inductively coupled through the skin with reasonable efficiency (Column 15, lines 27-35). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a biphasic signal to efficiently couple an electric signal through the skin.

Regarding Claim 50, Orban discloses a processor as stated in claim 42 but does not disclose full-wave rectification. Shannon discloses the use of full-wave rectifier circuits RECT1-4 and effectively derives the instantaneous envelope of the audio signals in the band. (Column 12, line 65 through Column 13, line 4). Therefore, it would

have been obvious to one of ordinary skill in the art at the time the invention was made to include full-wave rectifiers to effectively derive the instantaneous envelope of the audio signal as taught by Shannon.

Allowable Subject Matter

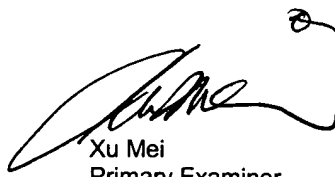
7. Claims 40, 41, 11-12, 30-32, and 34-39 are allowed.

Conclusion

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Xu Mei whose telephone number is 571-272-7523. The examiner can normally be reached on maxi flex.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vivian Chin can be reached on 571-272-7848. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Xu Mei
Primary Examiner
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11/08/2006